

IN THE CLAIMS:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Previously Presented) An improved machine vision vehicle wheel alignment system including a first camera system configured to view at least one optical target disposed on a first side of a vehicle, a second camera system configured to view at least one optical target disposed on a second side of the vehicle, and a processor configured to process images and to calculate vehicle wheel alignment measurements, the improvement wherein:

a plurality of reference targets, each of said plurality of reference targets disposed within a field of view of said camera systems;

said first camera system and said second camera system are configured for independent movement relative to each other; and

wherein said processor is configured to utilize images obtained by said first and second camera systems to identify a relationship between at least one of said reference targets and each of said camera systems to establish a common reference coordinate system between said first camera system and said second camera system.

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. **(Currently Amended)** An improved machine vision vehicle wheel alignment system including a first movable camera system configured to view one or more optical targets disposed on a first side of a vehicle disposed in a service bay, a second movable camera system configured to view one or more optical targets disposed on a second side of the vehicle, and a processor configured to process image data received from the camera systems to calculate vehicle wheel alignment measurements, the improvement wherein:

said first movable camera system and said second movable camera system have a variable positional relationship relative to each other;

at least one unique ~~fixed~~ reference target structure fixedly associated with each of said plurality service bays;

wherein during a vehicle service procedure in a selected one of said plurality of service bays, said associated at least one unique reference target structure is the ~~service bay~~ is disposed within a field of view of at least one camera from said first

movable camera system and within a field of view of at least one camera from said movable second camera system; ~~during a vehicle service procedure~~; and

wherein said data processor is configured to utilize identified relationships between said associated at least one unique reference target structure, said first movable camera system, and said second movable camera system to establish a common reference coordinate system associated with said selected service bay.

20. (Cancelled)

21. (Currently Amended) The improved machine vision vehicle wheel alignment system of Claim 19 wherein said processor is further configured to store a plurality of calibration values ~~for a~~ associated with said plurality of service bays each having an associated unique reference target structure, said calibration values each indexed to at least one of said ~~associated~~ unique reference target structures to identify said associated service bay bays.

22. (Previously Presented) A method for configuring a machine vision vehicle wheel alignment system having a first camera system configured to view at least a first set of optical targets associated with a vehicle and at least a second camera system configured to view at least a second set of optical targets associated with a vehicle, comprising:

positioning said first camera system to acquire images of said first set of optical targets, said first camera system including at least one alignment camera configured to view at least one optical target in said first set of optical targets and a common reference target in the same field of view;

positioning said second camera system to acquire images of said second set of optical targets, said second camera system including at least one alignment camera configured to view at least one optical target in said second set of optical targets and said common reference target structure in the same field of view;

wherein a positional relationship between said first camera system and said second camera system is variable;

acquiring images of at least one optical target in said first set of optical targets visible in said field of view of said first camera system;

acquiring images of at least one optical target in said second set of optical targets visible in said field of view said second camera system;

acquiring from each camera system, at least one image of said common reference target; and

following each positioning movement of said first and second camera systems during a vehicle service procedure, establishing a common reference coordinate system associated with a current positional relationship between said first and second camera systems from said acquired images of said common reference target.

23. (Cancelled)

24. (Previously Presented) The method of Claim 22 for configuring a machine vision vehicle wheel alignment system further including the steps of:

establishing a first coordinate reference system from said acquired images of said common reference target within said field of view of said first camera system;

establishing a second coordinate reference system from said acquired images of said common reference target within said field of view of said second camera system; and

utilizing said first coordinate reference system and said second coordinate reference system to establish said common coordinate reference system.

25. (Cancelled)

26. (Previously Presented) A method for configuring a machine vision vehicle wheel alignment system having a first camera system configured to view a first set of optical targets including at least one fixed reference target and at least one alignment target and a second camera system configured to view a second set of optical targets including at least one fixed reference target and at least one alignment target, the fixed reference targets in the first and second sets of optical targets having a predetermined relationship, comprising:

positioning at least one camera in said first camera system to have a field of view including said fixed reference target and an alignment target from said first set of optical targets;

positioning said second camera system to have a field of view including said fixed reference target and an alignment target from said second set of optical targets;

acquiring at least one image of said fixed reference target from said first set of optical targets with said first camera system;

acquiring at least one image of said fixed reference target from said second set of optical targets with said second camera system; and

establishing a common reference coordinate system from said acquired images and the predetermined relationship between said first and second fixed reference targets from said sets of optical targets.

27. (Previously Presented) The method of Claim 26 for configuring a machine vision vehicle wheel alignment system further including the steps of:

wherein positioning of said first camera system may vary relative to the positioning of said second camera system.

28. (Cancelled)

29. (Previously Presented) The improved machine vision vehicle wheel alignment system of Claim 9 wherein said plurality of reference targets are identifiably associated with a vehicle service bay; and wherein said data processor is further configured to store at least one calibration value associated with said vehicle service bay, said stored calibration value indexed to said plurality of reference targets identifiably associated with said vehicle service bay.

30. (Previously Presented) The improved machine vision vehicle wheel alignment system of Claim 9 wherein said first camera system includes at least one alignment camera configured to view at least one optical target disposed on the first side of a vehicle and said at least one of said reference targets in the same field of view;

wherein said second camera system includes at least one alignment camera configured to view at least one optical target disposed on the second side of the vehicle and said at least one of said reference targets in the same field of view.